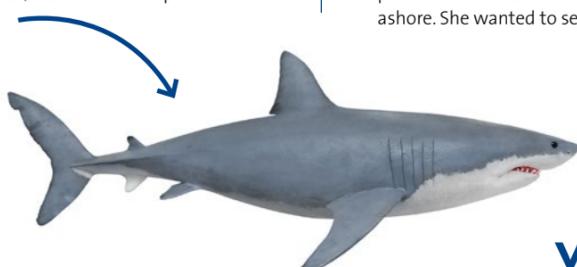


ONE SHARK CAN KILL THE INTERNET. REALLY?

Sharks are widely demonized as the killers of the seas. However, attacks on humans are extremely rare. Another rumor that has been circulating for years is that sharks eat the Internet. The theory goes that the seabed is one enormous cable buffet, which is an irresistible delicacy for sharks. But how about us? Do we really believe that one shark can kill the Internet? Here are the facts:

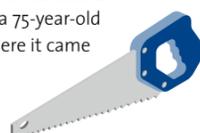
IT WAS HIM!

Anyone who thinks that it's the shark's fault if an Internet cable breaks down is wrong. Usually, any damage is the result of fishing boat anchors, dragnets, seaquakes, rock falls or sharp edges on the seabed.



NO, IT WAS HER!

In 2011, the Internet suddenly went down in Armenia and Georgia. Shark attack? Sabotage? No, it was a 75-year-old pensioner who sawed through the cable where it came ashore. She wanted to sell it as scrap metal.



TOUGH CABLES

Anchors, earthquakes, currents – submarine cables need to be prepared for everything. Freudenberg Performance Materials reduces cable vulnerability and offers three valuable characteristics:

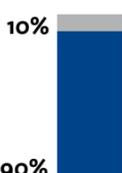
- Excellent swelling properties, even in salt water
- Particularly high isotropic tensile strength
- Very good electrical conductivity

YUMMY! DELICIOUS PREY!

Through its highly sensitive sensory organs, the shark can detect the electromagnetic field that surrounds some cables. Scientists suspect that this misleads the shark. It believes that the cable is an injured fish.

HOMEMADE

More than 90% of all cable damage is caused by humans (e.g. by anchors and nets). A little less than 10% is caused by nature (earthquakes or storms).



NO ENTRY FOR WATER!

Water blocking tapes from Freudenberg Performance Materials are used to immediately and reliably contain damage to a submarine cable. To achieve this, a superabsorbent polymer powder (SAP powder) is bonded to the nonwoven. The second it comes into direct contact with water, it swells, closes cavities and prevents further penetration. These SAP powder granules are capable of absorbing 300 times their own weight of water.

»The higher the cable quality, the smaller the repair effort. This is why using Freudenberg nonwovens has already paid off for us. With repair costs in the seven-figure range, the savings are enormous.«

A Freudenberg Performance Materials customer

0.2 KM/H

Better to bury it
To protect submarine cable from danger, it can also be buried in the seabed. This is done by means of a special plough with a speed of around 0.2 km/h.

885,000 KM

is the total length of cable in the sea. It transmits 99% of all data – faster and more cheaply than a satellite. Antarctica is the only continent that is not supplied by cable, but by satellite. This means that our “cloud” systems do not fly around in a virtual environment, but lie very physically on the seabed.

SINGLE LAYER VS. DOUBLE LAYER

Freudenberg Performance Materials offers two types of water blocking tapes: single layer and double layer. A major advantage of the single layer variant is that the swelling gel can quickly and reliably seal complex cavities. The challenge here is to securely bond the swelling powder to the nonwoven so as to avoid creating powder dust during cable production. After all, the swelling powder should end up in the cable and not on the floor of the production hall.

The first time

On August 28, 1850, the first submarine cable was laid between Dover, UK and Calais, France. The first telegram was then fired through the sea. The next day, a fishing net disrupted transmission.



THE DEEPER, THE HIGHER

The deeper submarine cable lies, the higher the repair costs. As soon as the fault has been found, a special ship goes to the site and “fishes” it from the bottom of the sea. The damaged part is removed and later replaced by a new piece. This can take several days or even weeks. (By the way, repair ships are permanently on standby around the globe).



FAREWELL, INTERNET!

Supposedly, the worldwide Internet repairs itself, because – if a cable breaks down – bits and bytes simply look for another way to reach their destination. As long as there are several cables, this is actually true. However, the fact remains that defective cables can cut off entire continents from the data stream or cause stock markets to collapse:

- 2006** — Seaquake off Taiwan: 120 million telephone lines in East Asia fail, banks and stock markets are cut off from trading.
- 2008** — Series of breakdowns in the Arab world. Within a few days, several cables rupture off the coast of Egypt and in the Persian Gulf. Around 100 million people are offline for days.
- 2018** — Submarine cable is destroyed off the coast of West Africa. It is the only one that provides Sierra Leone with Internet access.

Wow



By 2025, the transatlantic data stream is expected to increase by a factor of eight.

HALF THE WORLD IS ON THE NET

Almost 3.5 billion people are connected to the Internet – that's a good half of the world's population.



38,000 KM

The world's longest submarine cable (SEA-ME-WE 3) connects Southeast Asia, the Middle East and Western Europe. The shortest submarine cable (Flores-Corvo Cable System) connects four islands in the Atlantic Ocean and measures 680 km.



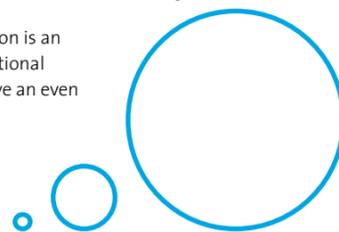
71 MILLIONEN VIDEOS

The most powerful submarine cable can send 71 million HD videos simultaneously – at 160 terabits per second. It is called MAREA and connects Bilbao (Spain) with Virginia Beach (USA). Length: 6,600 km, weight: 4,650 tons, depth: 3,300 meters, diameter: only about 1.5 times as thick as a garden hose.

COMPARISON OF DIAMETERS

- Inshore submarine fiber optic cable: 5 cm
- Submarine cable: 15 - 30 cm
- Underwater oil/gas pipe: 60 cm - 1.5 m

The fiber optic cable in question is an Inshore submarine OFC. Traditional OFCs that are laid on land have an even smaller diameter.



»» The Internet – is that thing still around?«

Homer Simpson